

**CLAIMS**

1 1. A method of positioning a recording head relative to an  
2 optical servo system in a magnetic recording tape system  
3 read/write assembly comprises:

4 positioning an optical sensor of the optical servo system  
5 at a first position relative to a selected one of a plurality  
6 of recording channels on the recording head; and

7 positioning the optical sensor at a second position  
8 relative to the selected recording channel using an alignment  
9 target on the recording head.

1 2. The method of claim 1 wherein positioning the optical  
2 sensor at the first position comprises:

3 visually aligning under a microscope the optical sensor  
4 relative to the recording channel along an imaginary line with  
5 an optical servo system adjuster; and

6 temporary locking the optical servo system in place with  
7 the adjuster.

1 3. The method of claim 1 wherein the alignment target  
2 includes a plurality of etched parallel grooves, the grooves  
3 positioned parallel to a direction of magnetic tape travel.

1 4. The method of claim 3 wherein each of the grooves  
2 comprises a profile to enhance optical signal reflectivity.

1 5. The method of claim 4 wherein the profile comprises:

2 a groove depth;

3 a sloped wall having a groove angle; and

4 a bottom shape.

1 6. The method of claim 5 wherein the groove depth is in the

2 range of 200-300 nanometers.

1 7. The method of claim 5 wherein the groove angle is 50-60

2 degrees.

1 8. The method of claim 5 wherein the bottom shape is round.

1 9. The method of claim 3 wherein each of the grooves is

2 fabricated on a silicon wafer.

1 10. The method of claim 3 wherein each of the grooves is

2 fabricated on aluminum titanium carbide (AlTiC) wafer.

1 11. The method of claim 3 wherein each of the grooves is

2 fabricated on a silicon/ AlTiC wafer.

1 12. The method of claim 3 wherein the grooves are fabricated

2 using image reversal resist.

1 13. The method of claim 3 wherein the grooves are fabricated

2 using a bi-layer resist process.

1 14. The method of claim 1 wherein the alignment target is  
2 positioned between one read-write element of the selected  
3 recorded channel and the other read-write element of the  
4 selected recording channel.

1 15. The method of claim 3 wherein positioning the optical  
2 sensor at a second position comprises:

3 directing a beam of light from the optical servo system  
4 towards the grooves;

5 moving the optical servo system perpendicularly to the  
6 grooves until a maximum optical reflectance signal is detected  
7 by an optical sensor of the optical servo system; and

8 locking the optical servo system with the adjuster when a  
9 minimum optical reflectance signal is detected.

1 16. A recording head in a read/write assembly of a magnetic  
2 recording tape system comprises:

3 a plurality of recording channels fabricated on a wafer;  
4 and

5 an alignment target affixed to the wafer between a first  
6 read-write element of a recording channel and a second read-  
7 write element of the recording channel, the alignment target  
8 fabricated to produce an optical reflectance signal.

1 17. The recording head of claim 16 wherein the alignment  
2 target is affixed to the wafer using an ultraviolet (UV) cured  
3 adhesive.

1 18. The recording head of claim 16 wherein the recording head  
2 and the alignment target are fabricated from the same  
3 material.

1 19. The recording head of claim 18 wherein the material is  
2 silicon.

1 20. The recording head of claim 18 wherein the material is  
2 aluminum titanium carbide (AlTiC).

1 21. The recording head of claim 18 wherein the material is  
2 silicon - AlTiC composite.

1 22. The recording head of claim 16 wherein the alignment  
2 target comprises a plurality of etched alignment grooves, each  
3 of the grooves equally spaced apart from each other and  
4 arranged parallel to a direction of magnetic tape travel.

1 23. The recording head of claim 22 wherein the grooves are  
2 fabricated using an image reversal resist process.

1 24. The recording head of claim 22 wherein the grooves are  
2 fabricated using a bi-layer resist process.

1 25. The recording head of claim 16 wherein each of the  
2 grooves has a profile to maximize optical signal reflectivity.

1 26. The recording head of claim 25 wherein the orientation  
2 comprises a groove depth, a sloped wall groove angle and a  
3 bottom shape.

1 27. The recording head of claim 26 wherein the groove depth  
2 is in the range of 200 to 300 nanometers.

1 28. The recording head of claim 26 wherein the sloped wall  
2 groove angle is in the range of 50 to sixty degrees.

1 29. The recording head of claim 26 wherein the bottom shape  
2 is round.

1 30. An alignment target for aligning a flathead recording  
2 head relative to an optical servo system in a read/write  
3 assembly of a magnetic tape recording system comprises equally  
4 spaced alignment grooves having dimensions to fit between a  
5 recording channel pair residing on the flathead recording  
6 head, the groove oriented parallel to a direction of tape  
7 travel across the flathead recording head.

1 31. The alignment target of claim 30 wherein each of the  
2 alignment grooves is fabricated to a profile to minimize  
3 optical signal reflectance.

1 32. The alignment target of claim 33 wherein the profile  
2 comprises a groove depth, a sloped wall groove angle and a  
3 bottom shape.

1 33. The alignment target of claim 32 wherein the groove depth  
2 is in the range of 200 to 300 nanometers.

1 34. The alignment target of claim 32 wherein the sloped wall  
2 groove angle is in the range of 50 to sixty degrees.

1 35. The alignment of claim 32 wherein the bottom shape is  
2 round.

1 36. A method comprising:  
2 sizing a wafer to fit between two adjacent recording  
3 channels residing on a recording head of a magnetic read/write  
4 assembly; and

5 forming a plurality of equally spaced parallel alignment  
6 grooves arranged perpendicularly to a length of the wafer a  
7 parallel to a travel direction of a magnetic tape.

1 37. The method of claim 36 wherein forming comprises cutting  
2 the wafer to maximize an optical signal reflectance.

1 38. The method of claim 37 wherein cutting comprises a groove  
2 depth, a groove angle and a bottom shape in the wafer.

1 39. The method of claim 38 wherein cutting comprises an image  
2 reversal resist process.

1 40. The method of claim 38 wherein cutting comprises a bi-  
2 layer resist process.